

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

APPLICANT: BAYER et al.

DATE: July 11, 2007

SERIAL NO.: 10/806,026

GROUP ART UNIT: 1713

FILED: 03/22/2004

EXAMINER: Lipman, Bernard

FOR: THERMOPLASTIC RAILROAD CROSS-TIES

ATTORNEY DOCKET NO.: C04057US (88155.2C)

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

**BRIEF OF APPELLANT**

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sirs:

On 11 January 2007, the Office finally rejected Claims 36-39, 44-47, and 64-74 of the above-referenced patent application. A Notice of Appeal was filed on 11 May 2007, and was received by the USPTO on 11 May 2007. This brief, required by 37 C.F.R. § 41.37(a), is due by 11 July 2007 (see 37 C.F.R. § 1.8(a)(2) and MPEP § 512 (Eighth Edition, Revision 2, May 2004)); it is in the form required by 37 C.F.R. § 41.37(c).

**(i) REAL PARTY IN INTEREST:**

The real party in interest is Polysum Technologies, L.L.C., assignee.

**(ii) RELATED APPEALS AND INTERFERENCES:**

There are no related appeals or interferences.

**(iii) STATUS OF CLAIMS:**

Claims 36-39, 44-47, and 64-74 are pending in the application. Claims 36-39, 44-47, and 64-74 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,658,519 issued to March or U.S. Patent No. 5,916,932 issued to Nosker, each further taken with U.S. Patent No. 3,933,731 issued to Machi or U.S. Patent No. 4,165,302 issued to Armenti in view of U.S. Patent No. 4,925,094 issued to Buckett or U.S. Patent No. 4,083,491 issued to Hill.

The rejection of Claims 36-39, 44-47, and 64-74 is being appealed.

(iv) STATUS OF AMENDMENTS:

No amendments after the final Office Action have been filed.

(v) SUMMARY OF CLAIMED SUBJECT MATTER:

As required by 37 C.F.R. § 41.37(c)(1)(v), Applicant has read some of the appealed claims on the specification and drawings. These claims follow:

36. A railroad tie [168, 468, 478] made by melt processing [spec. p. 11, l. 13-14; p. 16, l. 7 - p17, l. 3; p. 23, l. 20-22; p. 26, l. 13-16] a thermoplastic composition comprising:
- (a) a thermoplastic resin [spec p. 10, l. 10-11; p. 11, l. 27-p. 12, l. 17; p. 14, l. 1-3; p. 26, l. 3-5; p. 31, l5-p.35, l. 10]; and
  - (b) a calcium sulfate composition [spec. p. 10, l. 9-11] comprising a calcium sulfate present at a level of from 50 to 99 percent by weight [ spec. p. 17, l. 4-9] based on the total weight of the calcium sulfate composition [spec. p. 23, l. 12-16; p. 23, l. 27-p. 24, l. 10; p. 35, l. 14-15], and wherein the tie has substantially trapezoid-shape [Figs. 11, 12, 13 and 14], a top and a bottom, and the bottom is broader than the top.
44. A process [spec. p. 28, l. 30-p. 27, l. 2] for making a railroad track [72], the process comprising:
- (a) providing a plurality of the ties [168, 468, 478] of claim 36;
  - (b) laying the ties on a raised rail bed [Fig. 8]; and
  - (c) placing rail [76] on the ties [168, 468, 478].
64. A product made by the process of claim 44.
73. A railroad tie [168, 468, 478] made by melt processing [spec. p. 11, l. 13-14; p. 16, l. 7 - p17, l. 3; p. 23, l. 20-22; p. 26, l. 13-16] a thermoplastic composition comprising:
- (a) a thermoplastic resin [spec p. 10, l. 10-11; p. 11, l. 27-p. 12, l. 17; p. 14, l. 1-3; p. 26, l. 3-5; p. 31, l5-p.35, l. 10];
  - (b) a calcium sulfate composition [spec. p. 10, l. 9-11] comprising a calcium sulfate present at a level of from 50 to 99 percent by weight [ spec. p. 17, l. 4-9] based on the total weight of the calcium sulfate composition;
  - (c) a yellow colorant [spec. p. 25, l. 22-p. 26, l.2]; and

- (d) holes [100] for receiving carriage bolts [78] for securing rail [76] to the tie [Figs. 7, 8, 9 and 10; 168, 468, 478; spec. p. 24, l. 19-31], wherein:

the tie has substantially trapezoid shape [Figs. 11, 12, 13 and 14], a top and a bottom, and the bottom is broader than the top.

74. A railroad tie [168, 468, 478] made by melt processing [spec. p. 11, l. 13-14; p. 16, l. 7 - p17, l. 3; p. 23, l. 20-22; p. 26, l. 13-16] a thermoplastic composition comprising:

- (a) a thermoplastic resin [spec p. 10, l. 10-11; p. 11, l. 27-p. 12, l. 17; p. 14, l. 1-3; p. 26, l. 3-5; p. 31, l. 15-p.35, l. 10] in an amount of from 40 to 75 percent by weight based on the total weight of the thermoplastic composition [Spec. Formula 1, p. 31, l. 12-15; Formula 2, p. 31, l. 16-19; Formula 4, p. 31, l.25-29; Formula 5, p. 31, l. 30-p. 32, l. 4; Formula 7, p. 32, l. 11-16; Formula 8, p. 32, l. 17-22; Formula 10, p. 32, l. 30-p. 33, l. 6; Formula 11, p. 33, l. 7-13; Formula 13, p. 33, l. 22-29]; and
- (b) a calcium sulfate composition [spec. p. 10, l. 9-11] comprising a calcium sulfate present at a level of from 25 to 60 percent by weight [spec. p. 23, l. 12-16; p. 23, l. 27-p. 24, l. 10; p. 35, l. 14-15] based on the total weight of the calcium sulfate composition, wherein the tie has substantially trapezoid shape [Figs. 11, 12, 13 and 14], a top and a bottom, and the bottom is broader than the top.

(vi) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL:

Claims 36-39, 44-47, and 64-74 were rejected under 35 U.S.C. § 103(a) as being unpatentable over March or Nosker, each further taken with Machi or Armenti in view of Buekett or Hill.

(vii) ARGUMENT:

Claims 36-39, 44-47, and 64-74 are patentable over March or Nosker, each further taken with Machi or Armenti in view of Buekett or Hill under 35 U.S.C. § 103(a).

Applicants hereby traverse the rejection under 35 U.S.C. §103(a) of claims 36-39, 44-47, and 64-74. The claims were rejected based upon combinations of the following references: U.S. Patent No. 5,658,519 issued to March, U.S. Patent No. 5,916,932 issued to Nosker, U.S. Patent No. 3,933,731 issued to Machi, U.S. Patent No. 4,165,302 issued to Armenti, U.S. Patent No. 4,925,094 issued to Buekett, and U.S. Patent No. 4,083,491 issued to Hill. The office action also mentions

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U.S. Patent No. 2,985,617 issued to Salyer and U.S. Patent No. 5,128,397 issued to Horsey.

In the final rejection dated 11 January 2007, the following statements were made:

- (1) March and Nosker are deficient in not specifically disclosing (i) calcium sulfate with a purity of 50 to 99 wt. % as the filler, or (ii) the calcium sulfate filler is a fertilizer by-product;
- (2) March and Nosker, each further taken with Machi or Armenti, are deficient in not teaching a composition or process which includes admixture of epoxidized soybean oil prior to the melt processing of the composition; and,
- (3) March and Nosker, each further taken with Machi or Armenti, are deficient in not teaching that the shape of the railroad tie is wider at the bottom than at the top.

Applicants respectfully disagree with the Office that the Affidavit under 37 CFR 1.132 filed 17 November 2006 (the "First Bayer Declaration") is insufficient to overcome the rejections since the showing is not commensurate in scope to the claims in the polymers used. Applicants' previously submitted the First Bayer Declaration which provided evidence of long felt but unsolved need, unexpected and superior results, and commercial success. Applicants hereby incorporate by reference the First Bayer Declaration and accompanying exhibits therein. Applicants submit that the First Bayer Declaration and accompanying exhibits provided sufficient evidence of nonobviousness to overcome the references cited.

Notwithstanding, Applicants submitted the Second Declaration of John C. Bayer Under 37 CFR 1.132 (the "Second Bayer Declaration") which provides evidence commensurate in scope with the claims in the polymers used. In the Second Bayer Declaration, the cross-ties discussed in the letters previously submitted with the First Bayer Declaration were made in accordance to the pending claims. As the cross-ties described in the letters meet the limitations of the claims, the Second Bayer Declaration offers a showing commensurate in scope to the claims in the polymers used. High density polyethylene ("HDPE") is a type of polyolefin.

The relevance of long-felt need and the failure of others to the issue of obviousness depends on several factors. First, the need must have been a persistent one that was recognized by those of

ordinary skill in the art. In re Gershon, 372 F.2d 535, 539, 152 USPQ 602, 605 (CCPA 1967). In the present application, the problem of replacing chemically treated wood railroad cross ties is well known. Second, the long-felt need must not have been satisfied by another before the invention by applicant. Newell Companies v. Kenney Mfg. Co., 864 F.2d 757, 768, 9 USPQ2d 1417, 1426 (Fed. Cir. 1988). In the present application, Applicants believe themselves to be the first inventors of the railroad ties as claimed (see Declaration of Inventors previously filed). Third, the invention must in fact satisfy the long-felt need. In re Cavanagh, 436 F.2d 491, 168 USPQ 466 (CCPA 1971). MPEP 716.04.

The First Bayer Declaration provides exhibit attachments which show that the invention as claimed has solved this problem. The Second Bayer Declaration provides a further showing that the trapezoidal shape offers substantial performance satisfaction.

“A greater than expected result is an evidentiary factor pertinent to the legal conclusion of obviousness ... of the claims at issue.” In re Corkill, 711 F.2d 1496, 226 USPQ 1005 (Fed. Cir. 1985). The First Bayer Declaration shows that the results were greater than those which would have been expected from the prior art to an unobvious extent, and that the results are of a significant, practical advantage. Ex parte The NutraSweet Co., 19 USPQ2d 1586 (Bd. Pat. App. & Inter. 1991); MPEP 716.02(a). The Second Bayer Declaration shows significant practical advantages of the trapezoidal shape.

To be pertinent to the issue of nonobviousness, the commercial success of devices falling within the claims of the patent must flow from the functions and advantages disclosed or inherent in the description in the specification. MPEP 716.03(b). Again, as indicated by the exhibits to the First Bayer Declaration, additional purchases were made specifically due to the performance of the railroad ties as claimed in the present application.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference

teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). MPEP 706.02(j). Applicants respectfully submit that none of these criteria have been met by the office action dated January 11, 2007.

When applying 35 U.S.C. 103, the following tenets of patent law must be adhered to: (a) the claimed invention must be considered as a whole; (b) the references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination; (c) the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and (d) reasonable expectation of success is the standard with which obviousness is determined. *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986); MPEP 2141.

A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). Applicants respectfully submit that it is inappropriate to combine the references as cited in the January 11, 2007 Office action because those references would not result in Applicants' invention as claimed.

March teaches the use of rigid reinforcing bars; March discloses "rigid reinforcing bars are embedded within the plastic shell to stiffen the composite structure" (see March at col. 3, line 17). March further teaches that "at least four reinforcing bars are preferably used" (see March at col. 3 line 58 - col. 4, line 30). Claim 1 of March (the only independent claim) requires "providing a plurality of discrete, substantially rigid reinforcing bars" (col. 6, lines 44-46).

By combining March with Nosker, the Office is eliminating an essential part of March if the reinforcing bars are removed. As disclosed by March,

"the invention includes a plastic core having a central longitudinal

axis and a peripheral surface and a plastic shell surrounding the plastic core and bonded to the peripheral surface of the plastic core. A plurality of rigid reinforcing bars are embedded within the plastic shell in positions substantially parallel to the central longitudinal axis of the plastic core” (March, col. 2, lines 24-34).

Any combination of references which include March must include the use of the reinforcing bars of March because the reinforcing bars “give the desired strength and corrosion properties.” (March, col. 3, lines 62-63; see also col. 3, line 61-col. 54, line 30).

Nosker teaches use of a “coated fiber component” (see Nosker at col. 4, lines 32-35). Nosker further discloses that the “fillers” are “coated fiberglass” (see Nosker at col. 5, line 26 - col. 6, line 24). Nosker discloses

“Because of the highly oriented fiber content in the direction of the floor (the long axis of a railroad tie), the tie exhibits incredible strength and rigidity along that axis. At the same time, in a perpendicular axis which cuts across the orientation of the fiber content, the tie is relatively softer and flexible” (Nosker, col. 7, lines 51-57).

Any combination of references which include Nosker must include the use of the coated fiber reinforcing materials of Nosker because a railroad tie made with such coated fiber reinforcing materials “will not bend or stress rail laid perpendicularly thereon” (Nosker, col. 7, lines 57-60) and “the strength of the tie along the tie’s longest axis rails attached thereto will not be allowed to shift laterally or separate” (Nosker, col. 7, lines 61-64).

Applicants submit that there is no suggestion or motivation to combine Machi with March or Nosker to obtain Applicants’ invention as any such combination would require either the reinforcing bars of March or the coated fillers of Nosker. Further, Machi discloses that suitable filler materials possess a high degree of purity: about 0.1% by weight (Machi, col. 4, lines 1-30) and that

“it is desired to control the content of metal compounds as additive to be 1% by weight based on the weight of the [filler material]” (Machi, col. 4, lines 31-44).

Applicants submit that there is no suggestion or motivation to combine Armenti with March or Nosker to obtain Applicants’ invention, again, as any such combination would require either the reinforcing bars of March or the coated fillers of Nosker. Armenti merely teaches use of atactic polypropylene.

Applicants respectfully disagree that either Buckett or Hill would suggest the manufacture of thermoplastic ties with a trapezoidal shape. Buckett teaches concrete ties (see Buckett, claim 1) and an enhancement to reduce the abrasive effects of the rail on the concrete tie. Buckett discloses “it is well known that direct contact of the rail on the tie can result in serious abrasion of the concrete surface” (Buckett, col. 1, lines 13-16). Buckett teaches a “concrete railroad tie in which each rail seat has a stainless steel or other non-corrodable metal or plastics plate secured to the top surface of the tie” (Buckett, col. 2, lines 25-29). Nothing in Buckett suggests a tie should be made in a trapezoidal shape.

Hill teaches use of a rigid corrugated metal with at least two individually distinct rail support blocks and at least one self-supporting rigid sheet member (Hill, abstract; col. 2, lines 50-52; claims 1, 4, and 5). While the blocks are larger on the bottom than on the top, this relates to the length of the block, and not its width. (Hill, Fig. 2a; col. 3, line 59-col. 4, line 1) Nothing in Hill suggests a trapezoidal tie (as viewed from the end of the tie) could be constructed as a full length tie, without the need for corrugated steel reinforcement. Further, Hill discloses that

“the rail-supporting function of th new tie is provided by individually distinct rail-support block. Only so much of the material that is necessary to the rail-supporting function is provided in that tie in the form of such blocks, so that appreciable savings result *over making an entire tie of such material*” (Hill, col. 3, lines 40-50, emphasis supplied).



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Neither Buckett nor Hill indicates why it would be advantageous to make thermoplastic railroad cross ties in a trapezoidal shape.

Applicants submit that if Hill taught that a trapezoidal shaped composite tie was strong enough to support a train load, then Hill would not require the corrugated steel plates. Likewise, Applicants submit that if Buckett taught that a trapezoidal shaped composite tie was strong enough to support a train load, then Buckett would not require steel supports. As indicated in the Second Bayer Declaration, the trapezoidal shape of the Applicants' invention has proven to be extremely beneficial. "Because that insight was contrary to the understandings and expectations of the art, the structure effectuating it would not have been obvious to those skilled in the art." 713 F.2d at 785, 218 USPQ at 700 (citations omitted).). *Schenck v. Nortron Corp.*, 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983); MPEP 2141.02.

CONCLUSION:

For the foregoing reasons, applicant respectfully submits that all claims remaining in the application are allowable. A Notice of Allowance is hereby respectfully requested.

TELEPHONE CONFERENCE INVITATION:

Should the Examiner or any member of the Board feel that a telephone conference would advance the prosecution of this application, he/she is encouraged to contact the undersigned at the telephone number listed below.

PETITION FOR EXTENSION OF TIME:

Applicant hereby petitions the Commissioner under 37 C.F.R. § 1.136 for any extension of time necessary to render this Appeal Brief timely filed, and asks that the fee for any such extension be charged to Deposit Account No. 50-0694.

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FEES:

The \$250 fee required by 37 C.F.R. § 41.37(a)(2) and § 41.20(b)(2) is being charged to Deposit Account No. 50-0694. Please charge any additional fees due or credit any overpayment to Deposit Account No. 50-0694.

Respectfully submitted,

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(viii) CLAIMS APPENDIX:

CLAIMS ON APPEAL:

[Attorneys - check new rules - 37 C.F.R. § 41.37 for other changes, such as rules for attaching evidence, such as declarations, submitted during prosecution ]

36. A railroad tie made by melt processing a thermoplastic composition comprising:

- (a) a thermoplastic resin; and
- (b) a calcium sulfate composition comprising a calcium sulfate present at a level of from 50 to 99 percent by weight based on the total weight of the calcium sulfate composition, and wherein the tie has substantially trapezoid-shape, a top and a bottom, and the bottom is broader than the top.

37. The tie of claim 36 wherein the thermoplastic resin is a polyolefin.

38. The tie of claim 36 wherein the thermoplastic composition also includes an epoxidized oil.

39. The tie of claim 38 wherein the thermoplastic composition includes the thermoplastic resin in an amount of from 40 to 75 percent by weight based on the total weight of the thermoplastic composition, the calcium sulfate composition in an amount of from 25 to 60 percent by weight based on the total weight of the thermoplastic composition, and the oil in an amount of from 0.5 to 2 percent by weight based on the total weight of the thermoplastic composition.

44. A process for making a railroad track, the process comprising:

- (a) providing a plurality of the ties of claim 36;
- (b) laying the ties on a raised rail bed; and
- (c) placing rail on the ties.

45. The tie of claim 36 wherein the tie include holes for receiving carriage bolts for securing rail to the tie.

46. The process of claim 44 wherein the composition comprises a yellow colorant.

47. The railroad tie of claim 36, wherein the melt processing is extrusion under high shear pressure.

64. A product made by the process of claim 44.
65. The tie of claim 36 wherein the composition comprises a yellow colorant.
66. The process of claim 44 wherein the ties include holes for receiving carriage bolts for securing the rail to the ties.
- 5 67. The tie of claim 36, wherein the tie is monolithic and homogenous.
68. The tie of claim 36, wherein:  
the composition comprises a yellow colorant,  
the tie includes holes for receiving carriage bolts for securing rail to the tie.
69. The tie of claim 37, wherein:  
10 the composition comprises a yellow colorant,  
the tie includes holes for receiving carriage bolts for securing rail to the tie.
70. The process of claim 44, wherein:  
the composition comprises a yellow colorant,  
the ties includes holes for receiving carriage bolts for securing the rail to the ties.
- 15 71. The tie of claim 36 wherein the thermoplastic composition includes the thermoplastic resin  
in an amount of from 40 to 75 percent by weight based on the total weight of the  
thermoplastic composition, and the calcium sulfate composition in an amount of from 25  
to 60 percent by weight based on the total weight of the thermoplastic composition.
72. The tie of claim 71, wherein:  
20 the composition comprises a yellow colorant,  
the tie includes holes for receiving carriage bolts for securing rail to the tie.
73. A railroad tie made by melt processing a thermoplastic composition comprising:  
(a) a thermoplastic resin;  
(b) a calcium sulfate composition comprising a calcium sulfate present at a level of from  
25 50 to 99 percent by weight based on the total weight of the calcium sulfate  
composition;

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(c) a yellow colorant; and

(d) holes for receiving carriage bolts for securing rail to the tie, wherein:

the tie has substantially trapezoid shape, a top and a bottom, and the bottom is broader than the top.

5 74. A railroad tie made by melt processing a thermoplastic composition comprising:

(a) a thermoplastic resin in an amount of from 40 to 75 percent by weight based on the total weight of the thermoplastic composition; and

(b) a calcium sulfate composition comprising a calcium sulfate present at a level of from 25 to 60 percent by weight based on the total weight of the calcium sulfate composition, wherein the tie has substantially trapezoid shape, a top and a bottom, and the bottom is broader than the top.

EVIDENCE APPENDIX:

none

RELATED PROCEEDINGS APPENDIX:

none

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